UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,128	06/02/2000	James E. Hebert	5181-58500	8223

7590 08/04/2003

B Noel Kivlin
Conley Rose & Tayon P C
P O Box 398
Austin, TX 78767

EXAMINER
LOHN, JOSHUA A

ART UNIT	PAPER NUMBER
2184	7

DATE MAILED: 08/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/588,128	Applicant(s) HEBERT, JAMES E.
	Examiner Joshua A Lohn	Art Unit 2184

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7-19,22-29 and 32-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-14,16-19,22-29 and 32-43* is/are rejected.

7)☒ Claim(s) *15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 7, 8, 10, 22, and 32 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for using a heartbeat mechanism or status register polling, as shown on page 25, line 3, does not reasonably provide enablement for using both a heartbeat and a status register. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. Claims 7, 22, and 32, as well as their dependents, would require both the heartbeat mechanism of the independent claims and the status register polling to be present. This is in contradiction of the specification which, on page 25, indicates that one or the other method is to be used. For the purpose of examination it will be assumed that claims 7, 22, and 32 only make use of the status register polling.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4, 9, 11, 18-19, 23-29, and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Availability Features in the Sun™ X500 Server Family" in view of Mahalingam, United States Patent no. 6,052,733, filed October 1, 1997, and in further view of Kirch, United States Patent no. 6,324,161, filed April 30,1998.

As per claim 1, "Availability Features..." teaches of an alternate pathing system. This system contains at least a two-node computer network. Figure 3-1 shows the server as one node and any general Ethernet connection is the second node. The system provides for a primary network interface path to connect the two nodes, as well as a secondary network interface path that can be made to take over in the event of a primary network interface failure, see page 20. "Availability Features..." does not teach of a mechanism within the Application layer of the computer network for monitoring the first path to detect this failure, and then performing the failover to the second network path.

Mahalingam teaches of a server system, connected to a network, which utilizes multiple network interface cards to allow for multiple access paths, with one network interface card acting as the primary interface, see column 2, lines 23-34. He teaches of a mechanism, MULTISPAN, which is an application used for monitoring network paths, detecting failures of the paths, and performing failover of paths. MULTISPAN is a process, which acts as a high availability networking mechanism and operates within the system, see column 3, line 50. All paths to the network are monitored using the probe packet heartbeats, see column 8, line 55 through column 9, line 39. The MULTISPAN process will detect any failures during this monitoring and determine if the failure occurs to the primary network path. If the primary path fails, MULTISPAN does a switch-over to cause the secondary path to become the primary, completing a failover operation. It

would have been obvious at the time the invention was made to institute the MULTISPAN process of Mahalingam into the multimode system presented in "Availability Features..."

This would have been obvious because both inventors are striving for a highly available network systems. "Availability Features..." teaches of a multinode system in which alternate pathing promotes system availability, see page 20. It also stresses that in such environments system availability is critical, see page 1. "Availability Features..." also teaches that a manual switchover is useful to promote continued operation when using redundant pathing in a network. Mahalingam also teaches that systems and methods must be devised to protect users form hardware failures, and that redundant network interfaces are such a method, see column 2, lines 5-21. Mahalingam teaches the MULTISPAN process to promote the switchover of network interfaces, and the paths they access, in the event of failure, see column 9, lines 20-39. This process is merely an automation of the switch-over suggested in "Availability Features...". The automation of user processes was a well known concept in the art at the time the invention was made and it would have been obvious to automate the reliability enhancements suggested in "Availability Features..." with the MULTISPAN process taught by Mahalingam.

"Availability Features..." and Mahalingam fail to disclose the monitoring of the network including sending a heartbeat between nodes on the network. This is disclosed by Kirch, where the transmission of a heartbeat on the network acts as a request packet, for requesting that all other nodes acknowledge the first node. The reply packets are the heartbeat packets received from other nodes indicating an active state and showing a complete connection, see column 8, line 57 through column 9, line 29. The failure of

either packet to transmit will result in an indication of a failed network connection, see column 10 line 54 through column 11 line 5.

It would have been obvious at the time the invention was made to combine the invention of "Availability Features..." and Mahalingam wit the heartbeat featured by Kirch.

This would have been obvious because Kirch teaches of a desirability to minimize downtime in a local network by using redundant solutions, such as network cards, see column 1, line 64 through column 2, line 36. He also teaches of a need to detect communication failures in an effort to ensure proper operation of redundant network interfaces, see column 4, lines 58-63. Mahalingam also discloses using primary and secondary network interface redundancies, see figure 1. He further teaches using a heartbeat to detect a failure of the network interface itself, see column 2, lines 50-60. It would have been obvious to implement the heartbeat of Kirch to strengthen the network fault detection already implemented by Mahalingam. The heartbeat of Kirch would have been obvious to allow for the detection of not only a failure of the network interface, but the failure of the communication path used by the interface. This added detection would have been obvious to improve the fault detection desired in the invention of Mahalingam and "Availability Features...".

As per claim 2, the MULTISPAN process discussed above is a computer software product, see column 3, line 65 thorough column 4, line 5.

As per claim 4, the first node is taught to be a server, and the second node of the network could be any Ethernet type device, see figure 3-1 of "Availability Features...". The second node is naught taught to be a server. Official Notice is taken that both the

concept and the advantages of having an Ethernet type device be a server is well known in the art. It would have been obvious for the second node to be a server.

As per claim 9, Kirch teaches of detecting a failure of a first network path includes detecting that the reply packets are not received. This is taught in column 11, lines 1-5, where node A does not receive a reply, or heartbeat, packet from node B and detects this as a failure of network connection N1.

As per claim 11, Mahalingam teaches of failover including disabling the primary network adaptor, and its first network path, and enabling the second network adaptor to use its path as the network path, see column 9, lines 20-40.

As per claim 18, it is shown in the discussion of claim 4 that it is obvious for the second node to be a server. If the second node is the same type of server as that in the first node, it will contain a high availability mechanism that operates identically to that in the first node as described above. This would satisfy the limitations of claim 18.

As per claim 19, it is an apparatus of one node of the two node system shown in claim 1, and is shown in the first node of the discussions of claim 1.

As per claim 23, it contains the same limitations as claim 11 and is rejected under the same discussion.

As per claim 24, Mahalingam teaches of, following a monitoring operation, shutting down a primary network interface to disable it. Then configuring a secondary network interface with the same address information that was used by the primary network interface, in which a plumbing action is inherent in successful operation. The secondary network interface is then reset to enable it, and periodic monitoring continues as before, see column 9, lines 20-55.

As per claim 25, Mahalingam discloses the third network interface card, or secondary, taking over the address parameters corresponding to the first network interface card, or primary card. It is inherent that those address parameters would include an IP address, broadcast address, netmask address and MAC address due to the fact that the new primary interface card is to take over all processing of the old primary interface. In order to take this processing over all addresses must be changed so that the third network interface card matches the first network interface card.

As per claim 26, it is inherent in the disclosure of Mahalingam that if a virtual IP address is being used in the network, that the virtual IP address would be included in the address parameters being exchanged. Mahalingam would support a virtual IP address system because he discloses that any network protocol can be used, see column 6, line 4.

As per claim 27, "Availability Features..." teaches of the network cards being used to access an Ethernet network, see page 20. He doesn't teach that the adaptors are Ethernet adapters. Official Notice is taken that both the concept and the advantages of using an Ethernet adaptor to access an Ethernet network is well known in the art. It would have been obvious to use an Ethernet adaptor for connecting to an Ethernet network.

As per claim 28, "Availability Features..." teaches of the network cards being used to access an Ethernet network, see page 20. He doesn't teach that the adaptors are Gigabit Ethernet adapters. Official Notice is taken that both the concept and the advantages of using a Gigabit Ethernet adaptor to access an Ethernet network is well known in the art. It would have been obvious to use an Ethernet adaptor for connecting to an Ethernet network.

As per claim 29, it is an apparatus of the methods of claim 1 and the discussion used in the rejection of claim 1 applies to the limitations of claim 29 as well.

As per claim 33, it is an apparatus of the methods of claim 11 and the discussion used in the rejection of claim 11 applies to the limitations of claim 33 as well.

As per claim 34, it is a two-node implementation of the one-node apparatus in claim 24. Since the paths are both referenced with respect to the first node, the failover with respect to the paths would function the same in both the one-node and two-node embodiments. Thus claim 34 is rejected on the same grounds as claim 24.

As per claim 35, the limitations of this claim are the same as those of claim 25, and are rejected under the same grounds.

As per claim 36, the limitations of this claim are the same as those of claim 26, and are rejected under the same grounds.

As per claim 37, the limitations of this claim are the same as those of claim 27, and are rejected under the same grounds.

As per claim 38, the limitations of this claim are the same as those of claim 28, and are rejected under the same grounds.

As per claim 39, the second mechanism is the same as that put forth in claim 18, and is rejected under the same grounds.

Claims 3, 12-14, 16-17, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Availability Features in the Sun™ X500 Server Family" in view of Mahalingam, United States Patent no. 6,052,733, filed October 1, 1997, and in further view of Kirch, United States Patent no. 6,324,161, filed April 30,1998, and in still further

view of Mingus, "How-to: Simple 2 Computer Network wo/hub", published July 10, 1998.

As per claim 3, Kirch discloses, as shown in figure 1a, a first network path, N1, comprising a first network interface card, A1, in a first node, A, coupled to a second network interface card, B1, in a second node, B. He also discloses a second network path, N2, comprising a third network interface card, A2, on the first node coupled to a fourth network interface card, B2, on the second node. He fails to disclose the connection between the two interface cards being a crossover cable.

It is well known in the art that two Ethernet network interface cards can be connected directly using an Ethernet crossover cable, as is shown by Mingus paragraphs 2 and 3, and it would have been obvious at the time the invention was made to use an Ethernet network crossover cable in the invention of Kirch to connect the interface cards A1 and B1, and A2 and B2.

This would have been obvious because Kirch teaches of a network involving two computers, nodes A and B in figure 1a. He also teaches of using Ethernet interfaces, see column 2, line 31. Mingus discloses an obvious method to connect two Ethernet interfaces is an Ethernet crossover cable. Therefor, it would have been obvious for Kirch to use an Ethernet crossover cable to connect A1 to B1 and A2 to B2 to create a simple network connection between the two nodes.

As per claim 12, Kirch teaches of pausing monitoring in the event of a failure. This is disclosed in column 10, lines 54-61. The monitoring is paused in that the route table is modified to avoid the failed node, thus resulting in no more heartbeats being transmitted to or from that node. Mahalingam teaches of disabling the first network

interface card, the primary card, see column 2, line 31. Mahalingam further discloses configuring this third network card with the interface address parameters corresponding to the first network interface card, see column 2, lines 30-34, the plumbing operation is inherent in the changing of the address to allow the network interface to function. Mahalingam further discloses enabling the third network interface card through a resetting, see column 9, lines 35-36. Kirch teaches of the resuming of monitoring when a network path is repaired and the routing to that node commences, see column 8, lines 33-36

As per claim 13, Mahalingam discloses the third network interface card, or secondary, taking over the address parameters corresponding to the first network interface card, or primary card. It is inherent that those address parameters would include an IP address, broadcast address, netmask address and MAC address due to the fact that the new primary interface card is to take over all processing of the old primary interface. In order to take this processing over all addresses must be changed so that the third network interface card matches the first network interface card.

As per claim 14, it is inherent in the disclosure of Mahalingam that if a virtual IP address is being used in the network, that the virtual IP address would be included in the address parameters being exchanged. Mahalingam would support a virtual IP address system because he discloses that any network protocol can be used, see column 6, line 4.

As per claim 16, Kirch teaches of the interface cards being able to be Ethernet adapters, see column 2, line 31.

As per claim 17, Kirch teaches of the interface cards being able to be Ethernet adapters, see column 2, line 31, and since a Gigabit Ethernet is just a type of Ethernet, Kirch would teach of using Gigabit Ethernet adapters as well.

As per claim 40, this claim contains all the limitations of claim 3 in independent form, and as such is rejected under the same grounds.

Claims 7, 8, 10, 22, 32, and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Availability Features in the Sun™ X500 Server Family" in view of Mahalingam, United States Patent no. 6,052,733, filed October 1, 1997, and in further view of United States Patent no. 6,065,073, filed August 17,1998.

As per claim 7, "Availability Features..." teaches of an alternate pathing system. This system contains at least a two-node computer network. Figure 3-1 shows the server as one node and any general Ethernet connection is the second node. The system provides for a primary network interface path to connect the two nodes, as well as a secondary network interface path that can be made to take over in the event of a primary network interface failure, see page 20. "Availability Features..." does not teach of a mechanism within the Application layer of the computer network for monitoring the first path to detect this failure, and then performing the failover to the second network path.

Mahalingam teaches of a server system, connected to a network, which utilizes multiple network interface cards to allow for multiple access paths, with one network interface card acting as the primary interface, see column 2, lines 23-34. He teaches of a mechanism, MULTISPAN, which is an application used for monitoring network paths, detecting failures of the paths, and performing failover of paths. MULTISPAN is a

process, which acts as a high availability networking mechanism and operates within the system, see column 3, line 50. All paths to the network are monitored using the probe packet heartbeats, see column 8, line 55 through column 9, line 39. The MULTISPAN process will detect any failures during this monitoring and determine if the failure occurs to the primary network path. If the primary path fails, MULTISPAN does a switch-over to cause the secondary path to become the primary, completing a failover operation. It would have been obvious at the time the invention was made to institute the MULTISPAN process of Mahalingam into the multimode system presented in "Availability Features..."

This would have been obvious because both inventors are striving for a highly available network systems. "Availability Features..." teaches of a multinode system in which alternate pathing promotes system availability, see page 20. It also stresses that in such environments system availability is critical, see page 1. "Availability Features..." also teaches that a manual switchover is useful to promote continued operation when using redundant pathing in a network. Mahalingam also teaches that systems and methods must be devised to protect users form hardware failures, and that redundant network interfaces are such a method, see column 2, lines 5-21. Mahalingam teaches the MULTISPAN process to promote the switchover of network interfaces, and the paths they access, in the event of failure, see column 9, lines 20-39. This process is merely an automation of the switch-over suggested in "Availability Features...". The automation of user processes was a well known concept in the art at the time the invention was made and it would have been obvious to automate the reliability enhancements suggested in "Availability Features..." with the MULTISPAN process taught by Mahalingam.

"Availability Features..." and Mahalingam fail to disclose the monitoring of the network including the polling of a status register corresponding to the network path. Booth teaches of monitoring the status of a network path through polling the status register of the link, see column 8, lines 11-21.

It would have been obvious at the time the invention was made to use the status register polling of Booth to assist in making network monitoring of Mahalingam more simple.

This would have been obvious because Mahalingam teaches of monitoring the status of a network card by sending packets to and from the network interface, see column 2, lines 50-60. This same status monitoring could be done more simply and efficiently by just making a simple polling request to the status register of the desired network interface card, see column 8, lines 11-21 of Booth. It would have been obvious at the time the invention was made that the method of Booth provides the same results as that of Mahalingam and is improved in the more simplistic nature of the operation.

As per claim 8, Booth teaches of a status register on the network interface card, see column 8, lines 4-5.

As per claim 10, Booth teaches of detecting that the status register indicates if a network path has failed, see column 5, lines 44-45, when the link is down.

As per claim 22, it is an apparatus of one node of the two node system shown in claim 7, and is shown in the first node of the discussions of claim 7.

As per claim 32, it is an apparatus of the methods of claim 7 and the discussion used in the rejection of claim 7 applies to the limitations of claim 32 as well.

As per claim 41, this claim contains all the same limitations of claim 7 in an independent form, and all the above discussions would apply.

As per claim 42, it is an apparatus of one node of the two node system shown in claim 41, and is shown in the first node of the discussions of claim 41.

As per claim 43, it is an apparatus of the methods of claim 41 and the discussion used in the rejection of claim 41 applies to the limitations of claim 43 as well.

Allowable Subject Matter

Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua A Lohn whose telephone number is (703) 305-3188. The examiner can normally be reached on M-F 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoleil can be reached on (703) 305-9713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

JAL
July 28, 2003

SCOTT BADERMAN
PRIMARY EXAMINER